(54) COMMUTATOR-LESS MOTOR

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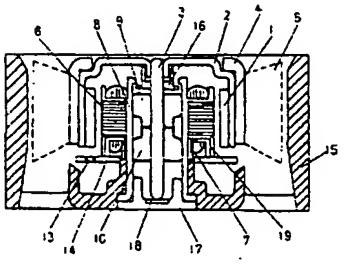
PURPOSE: To obtain a commutator-less motor with high reliability at a low cost by providing a stator core plate vertically bent in the direction of a circuit substrate to the outermost diameter section of the core plate nearest to the circuit substrate of a stator.

CONSTITUTION: A bearing 8 is constituted of sliding bearings 9 and 10 bearing a shaft 3 and an end receiving plate 18 of the shaft 3, and one piece 19 nearest to a circuit substrate 14 of a stator 6 winding a winding 7 on a projection bends the outermost diameter section thereof vertically in the direction of the circuit substrate 14. Even if the end of a permanent magnet 1 of a rotor is extended near to the circuit substrate 14, strong magnetic attraction still occurs in the direction of the circuit substrate 14 by the influence of the bent core plate 19. Accordingly, the movement of the rotor can be controlled by the end receiving plate 18 even if it is not controlled by the end of the sliding bearing 10, and even if the sliding bearing 10 is used, a commutator-less motor having high reliability can be obtained.



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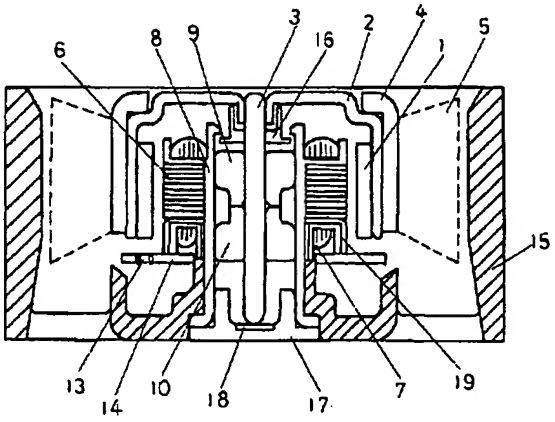
(54)【発明の名称】　無整流子モータ

(57)【要約】

【目的】　各種電気，電子機器において機器自体の信頼性が高まり、それらに使用される動力としては信頼性の高い無整流子モータが多く使われている。従来、これらに使用される無整流子モータにおいて軸受け部を滑り軸受けとするとその信頼性を維持することが困難であり、軸受け部を転がり軸受けとするとモータが高価になるという問題点を有していた。本発明はこれらの問題点を解決し安価で信頼性の高い無整流子モータを提供することを目的とする。

【構成】　巻線７が巻かれている固定子６の最も回路基板１４に近い一枚１９はその最大外径部が回路基板１４の方向にほぼ垂直に折り曲げられている。これにより回転子は回路基板１４の方向に強力な磁気吸引力で引き付けられるので従来のように滑り軸受け１０の端面で摺動することなく安定した位置で回転することができるので信頼性の高い無整流子モータを安価な滑り軸受けを使用して実現することができる。



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その外周に羽根５が取り付けられた負荷部である。８は軸受け部であり、シャフト３を支持する滑り軸受け９，１０とシャフト３の端面受け板１８で構成されている。１３は回転子の位置を検出するセンサーであり、回路基板１４に設置されている。６は固定子で突起部には巻線７が巻かれている。さらにこの固定子６の最も回路基板１４に近い一枚１９はその最大外径部が回路基板１４の方向にほぼ垂直に折り曲げられている。１５は羽根５の周りを取り囲み、軸受け部８を保持するファンモータのケースである。シャフト３には油切り１６が軸受け部からの油飛散防止の目的で取り付けられている。また、１７も軸受け部からの油漏れを防止する目的の部材でキャプである。このキャプ１７は端面受け板１８を保持している。

【００１２】以上のように本実施例によれば、回転子の永久磁石１の端部を回路基板１４の近傍まで延ばしてもまだ折り曲げたコア板１９の影響により回路基板１４の方向への大きな磁気吸引力が発生するので滑り軸受け１０の端面で回転子の動きを規制しなくても端面受け板１８で規制ができ、滑り軸受け１０の信頼性を損なうことがない。

【００１３】（実施例２）図２は図１の軸受け部の構成を変えた他の実施例の軸受け部のみを示したものである。これは軸受け部材の回転子側を転がり軸受け、他の一方を滑り軸受けとした軸受け部の例であり、２０は転がり軸受け、１０は滑り軸受け、２１は転がり軸受け２０の内輪に回転子の荷重をうけさせるためのスペーサである。３はシャフト、２はフレームである。この場合は転がり軸受け２０が回転子の動きを規制するので端面受け板は必要ない。また、転がり軸受けを使用する際に必要な予圧も回路基板方向への回転子の強力な磁気吸引力により得ることができるので高価な転がり軸受けを２個使用する必要がない。

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【００１４】

【発明の効果】以上のように本発明は、固定子の積層コアの最も回路基板側の一枚を回路基板側にほぼ垂直に折り曲げることにより回路基板側への大きな磁気吸引力を得ることができるので、軸受けに滑り軸受けを使用しても信頼性の高い無整流子モータを実現することができる。

【図面の簡単な説明】

【図１】第１の実施例における無整流子モータの断面図

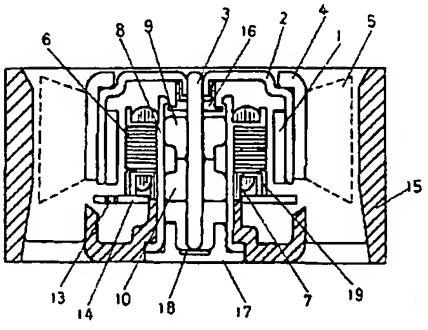
【図２】第２の実施例における無整流子モータの軸受け部の断面図

【図３】従来の無整流子モータの断面図

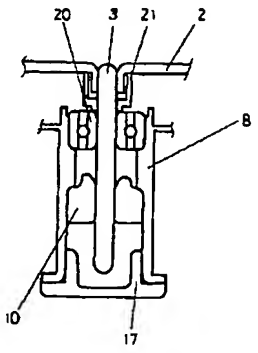
【符号の説明】

１　永久磁石
２　フレーム
３　シャフト
４　負荷部
５　羽根
６　固定子
７　巻線
８　軸受け部
９，１０　滑り軸受け
１１　摺動板
１２　抜け止め
１３　磁気センサー
１４　回路基板
１５　ケース
１６　油切り
１７　キャプ
１８　端面受け板
１９　コア板
２０　転がり軸受け
２１　スペーサ

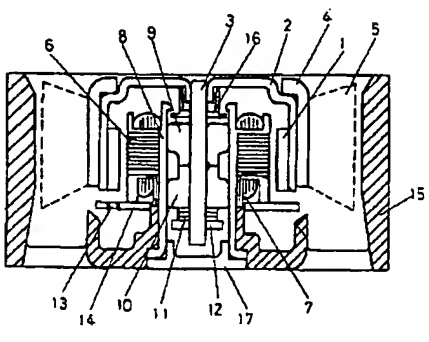
【図１】



【図２】



【図３】



* NOTICES *

1.This document has been translated by computer. So the translation may not reflect the original precisely.
2.**** shows the word which can not be translated.
3.In the drawings, any words are not translated.

DETAILED DESCRIPTION

[Detailed Description of the Invention]
[0001]
[Industrial Application] This invention relates to the motor structure of a non-commutator motor.
[0002]
[Description of the Prior Art] In recent years, the dependability of the device itself increases in various electrical and electric equipment and electronic equipment, and many non-commutator motors reliable as power used for them are used.
[0003] The conventional non-commutator motor is explained below. Drawing 3 shows the structure of the non-commutator motor currently used for the conventional fan motor for device cooling. In drawing 3 , in a permanent magnet and 2, a frame and 3 are shafts and, as for 1, these constitute the rotator. The load section 4 in which the wing 5 of a fan motor was attached is attached in the perimeter of a rotator by approaches, such as press fit. 6 is a stator which consists of two or more core plates, the inner skin of a permanent magnet 1 is countered, it is installed, and the coil 7 is coiled around the height -- it is. 8 is a bearing which consists of two sliding bearings 9 and 10 and several sliding plates 11, and holds the shaft of 3. It escapes in the edge of a shaft and the stop 12 is attached. Moreover, the magnetic sensor 13 for detecting the location of a rotator near the edge surface part of a permanent magnet 1 is installed in the substrate 14 with the current control circuit section of a coil 7. 15 is the case of a fan motor where surround the surroundings of a wing 5 and a bearing 8 is held. The oil thrower 16 is attached in the shaft 3 for the purpose of the oil scattering prevention from a bearing. Moreover, it is KYAPU in a member for 17 to prevent the oil spillage from a bearing.
[0004] About the non-commutator motor constituted as mentioned above, the actuation is explained below.
[0005] First, a magnetic sensor 13 detects the end-face magnetic flux of the permanent magnet 1 of a rotator, and sends the signal according to the magnetic flux to the control circuit section. The control circuit section passes a suitable current to a coil 7 in order to rotate a rotator in the direction of the right corresponding to this signal. A rotator is rotated according to this. Since the magnetic sensor 13 is always supervising the motion of a rotator, rotation of a rotator continues without stopping.
[0006]
[Problem(s) to be Solved by the Invention] However, it must put on the location which is distant from a laminating core to some extent since the location of a magnetic sensor 13 has a coil 7, in order to detect the magnetic flux of a permanent magnet, it is necessary to extend the edge of the permanent magnet 1 of a rotator to near the magnetic sensor 13, and with the above-mentioned conventional configuration, it changes in the direction where the magnetic-attraction force of a rotator is opposite to the circuit board with a natural thing. Therefore, in order to rotate a rotator in the stable location, it is necessary to restrict a motion of a rotator by the end face of a sliding bearing 10. Since a sliding bearing is generally weak to sliding of an end face, the life as a motor will become short. Moreover, in order to prevent this, it had the trouble that it was necessary to make a bearing into an expensive rolling bearing.
[0007] This invention solves the above-mentioned conventional trouble, and it is cheap and aims at offering a reliable non-commutator motor.
[0008]
[Means for Solving the Problem] In order to attain this purpose, the non-commutator motor of this invention has the stator core plate which bent the outermost diameter of the core plate of circuit board approach most almost at right angles to the direction with the circuit board of a stator.
[0009]

[Function] A rotator can be rotated in the location which did not need to restrict a motion of a rotator and was stabilized in that end face by this configuration even when a bearing was made into a sliding bearing, since the magnetic-attraction force of a rotator served as the direction of the circuit board.
[0010]
[Example] (Example 1) One example of this invention is explained below, referring to a drawing.
[0011] In drawing 1 , in 1, a frame and 3 are shafts and a permanent magnet and 2 form the rotator. 4 is the load section by which the wing 5 was attached in the periphery. 8 is a bearing and consists of end-face backing plates 18 of sliding bearings 9 and 10 and a shaft 3 which support a shaft 3. 13 is a sensor which detects the location of a rotator and is installed in the circuit board 14. As for 6, the coil 7 is coiled around the height by the stator. further -- this stator 6 -- the closest to the circuit board 14 -- one 19 is bent almost at right angles [that maximum outer-diameter section] to the direction of the circuit board 14. 15 is the case of a fan motor where surround the surroundings of a wing 5 and a bearing 8 is held. The oil thrower 16 is attached in the shaft 3 for the purpose of the oil scattering prevention from a bearing. Moreover, it is KYAPU in a member for 17 to prevent the oil spillage from a bearing. This KYAPU 17 holds the end-face backing plate 18.
[0012] As mentioned above, according to this example, since the big magnetic-attraction force to the direction of the circuit board 14 occurs under the effect of the still bent core plate 19 even if it extends the edge of the permanent magnet 1 of a rotator to near the circuit board 14, even if it does not regulate a motion of a rotator by the end face of a sliding bearing 10, regulation is possible with the end-face backing plate 18, and the dependability of a sliding bearing 10 is not spoiled.
[0013] (Example 2) Drawing 2 shows only the bearing of other examples which changed the configuration of the bearing of drawing 1 . It is the example of the bearing with which this made the rotator side of bearing material the rolling bearing, and made other one side the sliding bearing, and 20 is a spacer for a rolling bearing and 10 to receive a sliding bearing in the inner ring of spiral wound gasket of a rolling bearing 20, and for 21 make the load of a rotator received. 3 is a shaft and 2 is a frame. In this case, since a rolling bearing 20 regulates a motion of a rotator, an end-face backing plate is unnecessary. Moreover, since required precompression can also be obtained according to the magnetic-attraction force with the powerful rotator to the direction of the circuit board in case a rolling bearing is used, it is not necessary to use two expensive rolling bearings.
[0014]
[Effect of the Invention] As mentioned above, since this invention can acquire the big magnetic-attraction force by the side of the circuit board most by [of the laminating core of a stator / by the side of the circuit board] bending one sheet almost at right angles to a circuit board side, even if it uses a sliding bearing for a bearing, it can realize a reliable non-commutator motor.

[Translation done.]